type-underspecification and cross-domain parallels

Semantics 3, UCLA Linguistics

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1 today's goals

- exposure to cross-sentential anaphora and quantifiers unconstrained by syntax (Lewis, 1975)
- exposure to semantic operations with unspecified domains
- exposure to the analysis of indefinites as denoting free variables (Heim, 1982)

2 what's a quantifier?

- seriously, what's a quantifier, as far as you know?
- what sorts of syntax do you associate with quantifiers (binding relation, QR restrictions)?
- what are some morphosyntactic tests for quantifier status?
- three semantic tests for quantifiers (from Heim & Kratzer p132–5):

1. monotonicity: quantifiers vary, while referring expressions occur in upward-monotonic contexts

   (1) B is an acrobat. → B is a circus performer.

2. the Law of Contradiction: referring expressions can't be the subject of contradictory predicates

   (2) a. #Mount Rainier is on this side of the border, and MR is on the other side of the border.
   b. More than two mountains are on this side of the border, and more than two mountains are on the other side of the border.

3. the Law of Excluded Middle: when the subject of two predicates with no excluded middle, referring expressions result in tautologies

   (3) a. I am over 30 years old or I am under 40 years old.
   b. Every woman here is over 30 years old, or every woman here is under 40 years old.

3 what do adverbs of quantification range over?

- examples:
  - always, invariably, universally, without exception
  - sometimes, occasionally
  - never
  - usually, mostly, generally, almost always, with few exceptions, ordinarily, normally

- often, frequently, commonly
- seldom, infrequently, rarely, almost never

(4) not times
  a. Riders on the Thirteenth Avenue line seldom find seats.
  b. Few rides on the Thirteenth Avenue line find seats.

(5) not events or 'cases'
  a. A quadratic equation never has more than two solutions.
  b. No quadratic equation has more than two solutions.

(6) other instances with multiple bindees
  a. Sometimes it happens that x sells stolen goods to y, who sells them to z, who sells them back to x.
  b. Usually, x reminds me of y iff y reminds me of x.

(7) **unselective binders**[1]
  a. $\forall x\phi$ is true iff ϕ is true under every admissible assignment of values to all variables free in ϕ.
  b. $\exists x\phi$ is true iff ϕ is true under some admissible assignment of values to all variables free in ϕ.

- importantly, *if*-clauses can be use to restrict the domain of these quantifiers

(8) a. Often if it is raining my roof leaks.
  b. Most times it rains, my roof leaks.
  c. Usually, if x is a person and y is a donkey and z is a dog, y weighs less than x but more than z.

- also importantly, since these things are all introduced as syntactic adjuncts, there are no syntactic restrictions on them (or their relationships between one another)

4 some background: Heim 1982

- two types of indefinites:
  1. specific (paraphrasable with 'a certain N')
     - typically thought of as involving direct reference, cf. proper nouns

     (9) A syntactician won the award (namely Hilda)
     won(hilda, the-award)

  2. non-specific (paraphrasable with 'a N or other' or '...but I don't know which')
     - typically thought of as involving existential quantification

     (10) A syntactician won the award (but I don't know which)
     $\exists x$[syntactician(x) & won(x, the-award)]

4.1 arguments in favor of indefinites being existentials

- (from Russell, 1905)
- they behave like quantifiers on the Heim & Kratzer tests

(11) a. A is friends with a dog and B is friends with a dog.

[1] Cf. selective binders, e.g. $\forall x\phi$ is true, under any admissible assignment f of values to all variables free in ϕ except x, iff for every admissible value of x, ϕ is true under the assignment of that value to x together with the assignment of that value to x together with the assignment of f of values to the other variables free in ϕ.

b. A dog is in the room and a dog is outside of the room.

- they behave like existentials wrt negation

(12) a. It is not the case that a dog came in.
b. It is not the case that Fido came in.

- they can scope-take with other quantifiers

(13) a. Every child owns a dog.
b. Every child owns Fido.

4.2 arguments against

- (from Strawson, 1952)
- discourse anaphora

(14) A dog came in. It lay down under the table.

- rebuttal one: maybe quantifiers can scope cross-sententially!

(15) $\exists x[x$ is a dog & x came in & x lay down under the table$]$

- problem one: coordinating contradictory predicates

(16) A: A man fell over the edge.
B: He didn't fall; he jumped.

(17) $\exists x[x$ is a man & x fell over the edge & $\neg x$ fell over the edge & x jumped over the edge$]$

- problem two (Geach/Evans): incorrect truth conditions for coordinated predicates[2]

(18) a. There is a doctor in London and he is Welsh.
b. There is a doctor in London who is Welsh.

- problem three: lack of referents

(19) No dog came in. #It lay down under the table.[3]

- rebuttal two: the pronoun refers to speaker(-intended) referent, not semantic referent (Kripke, 1977)
  - problem one: I need not know the referent to use a discourse anaphor

(20) A dog has been rummaging in the garbage can. It has torn open all the plastic bags.

  - problem two: speaker reference isn't enough:

(21) a. I dropped ten marbles and found all of them, except for one. It is probably under the sofa.
b. I dropped ten marbles and found only nine of them. ??It is probably under the sofa.

(22) a. B has a spouse. She is nice.
b. B is married. ??She is nice.

- rebuttal three: discourse anaphors are disguised definite descriptions, not variables

(23) A dog came in. [The dog that came in] lay down under the table.

[2] From the oft-cited Geach (1962) and Evans (1980).

[3] One of the best papers ever was written on this topic, i.e. when you can get discourse referents cross-sententially and when you can't. It's one of the handful of foundational papers of dynamic semantics: Karttunen (1976).

- problem: same as above with a lack of synonymy

(24) a. There is a doctor in London. He is Welsh.
b. There is a doctor in London. The doctor in London is Welsh.

- Lewis' (1975) data

4.3 Heim's solution

- following Lewis (1975) and Karttunen (1976), indefinites introduce **discourse referents**: for our purposes, free variables to be bound or valued by higher elements in the tree

(25) Existential Closure (p90–2)
(i) Adjoin a quantifier ∃ to the nuclear scope of every quantifier.
(*to account for quantifier scope*)
(ii) Attach a sequence of sentences under a T-node.
(*to account for unembedded, non-specific indefinites*)

- in Chapter 3: definites are anaphoric to discourse referents
- implemented using **file cards**... "File Change Semantics"

references

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